

Request for Reconsideration  
U.S. Patent Application No. 09/711,126

### **REMARKS**

Reconsideration and continued examination of the above-identified application are respectfully requested.

At page 2 of the Office Action, the Examiner rejects claims 1, 3, 4, 6, 8-11, 13, 17-22, 24, 31-36, 38, 39, 41, and 42 under 35 U.S.C. §103(a) as being unpatentable over Sarkar et al. (U.S. Patent No. 5,169,497) with or without Sarkar et al. (U.S. Patent No. 5,507,914). At pages 2 and 3 of the Office Action, the Examiner repeats his reasons from the previous Office Action dated September 9, 2002 for rejecting the claimed invention over Sarkar et al. '497 with or without Sarkar et al. '914. The Examiner asserts that Table 1 in Sarkar et al. '497 uses enzyme treatment times of 10 to 60 minutes. The Examiner acknowledges that Sarkar et al. '497 does not indicate that a cationic polymer should not be added during the enzyme reaction. The Examiner also indicates that Sarkar et al. '497, like Sarkar et al. '914, describes that the enzyme can be added at any chest prior to the refiner and in the machine chest, and that this is the same point where the cationic polymer is added. According to the Examiner, no criticality has been shown for adding the additives less than 10 minutes apart, e.g. simultaneously. The Examiner also specifically refers to claims 3 and 5 of Sarkar et al. '914 for a list of equivalent cationic polymers that can be used in the process. The Examiner concludes that it would have been obvious to add different, but equivalent, cationic polymers in each of the multiple feed points taught by Sarkar et al. '914. For the following reasons, this rejection is respectfully traversed.

With respect to Sarkar et al. '497, this patent relates to improving freeness of paper pulp that includes adding to the pulp a cellulolytic enzyme, and allowing the pulp to contact the cellulolytic enzyme for at least 20 minutes. According to column 3 of Sarkar et al. '497, the

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invention requires that the pulp first be treated with the enzyme and then with the cationic polymer. Furthermore, Sarkar et al. '497, in column 3, indicates that the minimum treating time of the pulp with an enzyme is about 20 minutes. As seen in Table 1 of Sarkar et al. '497, the CSF values vary depending on the enzyme treatment time. Thus, Sarkar et al '497 clearly mandates that there be a waiting time of at least 20 minutes between the introduction of the cationic polymer and after the introduction of the enzyme. At least 20 minutes is not "within 5 minutes." At least 20 minutes is at least 4 times greater in value than within 5 minutes. As such, one skilled in the art would not conclude that at least 20 minutes is equivalent to within 5 minutes.

With regard to the Examiner's comment that no "criticality" has been shown with respect to adding the additives less than 10 minutes apart, the applicants and the undersigned respectfully point out to the Examiner that criticality is not a standard for patentability. The standard for patentability is whether the claimed invention is taught or suggested by the references applied by the Examiner. As the Examiner admits, each Sarkar et al. reference shows a delay in the treating time with the enzyme cationic polymer. Since 20 minutes is not "within 5 minutes" and is not even close to "within 5 minutes," it is clear that Sarkar et al. does not teach or suggest the claimed invention. Criticality is not the issue with respect to this determination. Further, claims 17 and 18, which recite times less than 5 minutes, are also different from the Examiner's interpretation of Sakar et al. Accordingly, it is clear that the Sarkar et al. patents do not teach or suggest the claimed invention.

With respect to the Examiner's reliance on Table 1 of Sarkar et al. '497, Table 1 does make references to 10 minutes. However, "10 minutes" is not the same as "within 5 minutes." It is double the time. In fact, one skilled in the art by reading Table 1 would see that a reduced reaction

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time results in a lower CSF value. For example, according to Table 1, at column 4, lines 39, 40, and 43, polymer 2 with enzyme 1 at a pH of 6, at 40 °C, and at a reaction time of 10 minutes, results in a CSF value of 506.63; however, the same composition at the same temperature, but at a reaction time of 35 minutes, results in a CSF value of 601.0, and at a reaction time of 85 minutes, results in a CSF value of 622.60. Therefore, one skilled in the art by reading Sarkar et al. and especially Table 1 of Sarkar et al., would conclude that a reaction time of greater than 20 minutes is required and that a reaction time of less than 10 minutes would result in a poor reaction. As such, Sarkar et al. clearly teaches away from going below 20 minutes, and certainly based on the poor CSF results, one skilled in the art would clearly not go below 10 minutes.

Additionally, no mention is made in Sarkar et al. '497 of pre-combining a cationic polymer and an enzyme or simultaneously adding at least one cellulytic enzyme composition and at least one cationic polymer to the pulp as recited in claims 13 and 18 of the present application respectively. Instead, column 3 of Sarkar et al. '497 requires that the pulp first be treated with the enzyme and then with the cationic polymer. Furthermore, no mention is made in Sarkar et al. '497 of using a nitrogen-containing polymer or a cationic starch as recited in claims 22, 33, and 34 of the present application.

Additionally, Sarkar et al. '497 does not teach or suggest first introducing a cationic polymer composition to the pulp and then introducing at least one cellulytic enzyme to form the pulp into paper, as recited in claim 31 of the present application. Instead, column 3 of Sarkar et al. '497 requires that the pulp first be treated with the enzyme, for a minimum treating time of about 20 minutes, and then with the cationic polymer. Because addition of the synthetic polymer affects the enzymatic reaction of the pulp by not allowing the enzyme to properly react with the pulp, one

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having skill in the art would not add the cationic polymer during the enzymatic reaction for a time shorter than 20 minutes. Thus, for reasons set forth above, Sarkar et al. '497 clearly teaches away from claims 1 and 31 and the claims dependent thereon.

With respect to the applicants' arguments submitted on January 7, 2003, the Examiner asserts that Table 1 of Sarkar et al. '497 shows CSF values of 558.84 for 35 minutes (Run 30) and 439.75 for 60 minutes (Run 3) and 645.96 for 10 minutes (Run 26). Accordingly, the Examiner concludes that the CSF values appear to increase for shorter times between addition of the cationic polymer and the enzyme, depending on the conditions. Thus, the Examiner asserts that it would have been obvious from the data of Table 1, to increase the time between additions for further improvements to the CSF.

With respect to the Examiner's argument regarding the CSF values shown at Table 1 of Sarkar et al. '497, it is important for the Examiner to recognize that the parameters of Runs 30, 3, and 26 differ from each other and, therefore, the CSF values obtained cannot properly be used as a basis for comparison. For example, the parameters of Run 30 include polymer 2, a pH of 6, an enzyme concentration of 0.1, and a temperature of 70°C. However, the parameters of Run 3 include polymer 1, a pH of 7.07, an enzyme concentration of 0.2, and a temperature of 25°C. Additionally, the parameters of Run 26 include polymer 3, a pH of 4.6, an enzyme concentration of 0.2, and a temperature of 55°C. In contrast, Runs 15, 20, and 21 of Table 1 can be compared to each other because their parameters include the same polymer (2), the same enzyme concentration (0.1), the same pH level (6), and the same temperature (40°C). According to Table 1, Run 21, which includes a reaction time of 10 minutes, results in a CSF value of 506.63. However, the same composition at the same temperature that has a reaction time of 35 minutes (Run 20), results in a

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CSF value of 601.0, and at a reaction time of 85 minutes (Run 15), results in a CSF value of 622.60. Accordingly, one skilled in the art, by reading Sarkar et al., would conclude that a reaction time of greater than 20 minutes is required, and that a reaction time of less than 10 minutes would not be good. As such, Sarkar et al. clearly teaches away from reacting a polymer composition to a paper making pulp below 20 minutes, and certainly based on the poor results in Table 1, one skilled in the art would clearly not be motivated to react a polymer composition to a paper making pulp below 10 minutes.

With respect to Sarkar et al. '914, this patent is very similar to Sarkar et al. '497 in that the purpose of the invention is to enhance the freeness of paper pulp. Sarkar et al. '914 further requires long delays between the introduction of the enzyme and the introduction of any cationic polymer. Therefore, for the same reasons discussed above with respect to Sarkar et al. '497, Sarkar et al. '914 does not teach or suggest the claimed invention. Accordingly, the rejection under 35 U.S.C. §103(a) over Sarkar et al. '497 with or without Sarkar '914 should be withdrawn.

At page 3 of the Office Action, the Examiner asserts that claims 2, 7, 12, and 23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sarkar et al. '497 with or without Sarkar et al. '914 as applied to claim 1 and further in view of EP 433 258. At pages 3 and 4 of the Office Action, the Examiner simply repeats his reasons from the previous Office Action dated September 9, 2002 for rejecting the claimed invention over Sarkar et al. '497 with or without Sarkar et al. '914 and further in view of EP 433 258. The Examiner asserts that EP 433 258 teaches that adding cationic starch or paper pulp during enzymatic treatment increases the strength of the paper. Therefore, according to the Examiner, it would have been obvious to add the cationic starch to the pulp of Sarkar et al. '497 to increase the paper strength as taught by EP 433 258. The Examiner

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also asserts that it would have been obvious to add the starch at various addition points in the same manner as the cationic starch and the enzyme in Sarkar et al. '914. For the following reasons, this rejection is respectfully traversed.

With respect to claims 2, 7, 12, and 23, these claims are dependent directly or indirectly on claim 1. As such, the reasons set forth above with respect to the patentability of claim 1 would also apply here. In addition, the Examiner has not explained how one skilled in the art could easily adapt the particular teachings set forth in EP 433 258 into either one of the Sarkar et al. patents. Sarkar et al., in each patent, clearly requires a long delay time between the introduction of enzyme and the cationic polymer. Thus, any introduction of a cationic starch as shown in EP 433 258 would require a long delay if used in Sarkar et al.

With respect to the Examiner's argument that it is obvious to add starch at various addition points, the Examiner provides no support for this conclusion. In addition, EP 433 258 clearly indicates that the starch is added prior to the enzyme. This is the opposite to the teaching of Sarkar et al. patents and thus would not make sense if the teaching of EP 433 258 were applied to Sarkar et al. Accordingly, the combination of EP 433 258 with Sarkar et al. is not possible. As such, for the reasons set forth above, claims 2, 7, 12, and 23 are patentable. Accordingly, the rejection under 35 U.S.C. §103(a) over Sarkar et al. '497 with or without Sarkar et al. '914 in view of EP 433 258 should be withdrawn.

At page 4 of the Office Action, the Examiner rejects claims 5 and 37 under 35 U.S.C. §103(a) as being unpatentable over Sarkar et al. '497 with or without Sarkar et al. '914 and further in view of WO 99/43780. Again, the Examiner repeats his reasons from the previous Office Action dated September 9, 2002 for rejecting the claimed invention over Sarkar et al. '497 with or without

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Sarkar et al. '914 and further in view of WO 99/43780. The Examiner asserts that WO 99/43780 describes stabilizing the enzymes during pulp treatment by using the enzymes in combination with a polyamide oligomer. Therefore, the Examiner asserts that it would have been obvious to add the polyamide oligomer of WO 99/43780 to stabilize the enzymes of Sarkar et al. '497. For the following reasons, this rejection is respectfully traversed.

WO 99/43780 relates to improving the shelf life stability of enzymes by using polyamide oligomers. The reference does not cure any of the deficiencies of Sarkar et al. Furthermore, claims 5 and 37 are dependent directly on claims 1 and 31. Therefore, the reasons set forth above with respect to the patentability of claims 1 and 31 would also apply here. Accordingly, the rejection under 35 U.S.C. §103(a) over Sarkar et al. '497 with or without Sarkar et al. '914 in view of WO 99/43780 should be withdrawn.

The Examiner is respectfully requested to contact the undersigned by telephone should there be any remaining questions as to the patentability of the pending claims.

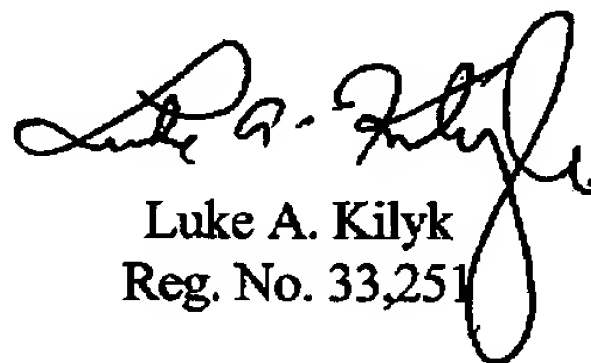
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**CONCLUSION**

In view of the foregoing remarks, the applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

If there are any other fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 50-0925. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,



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